**SA WG2 Meeting #142e S2-200**

**Nov16th – 20th , 2020 ; Elbonia (revision of S2-200)**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Handling of LS on IP address to GPSI translation (S2-2008358 / S6-202008)**

 **Document for: Agreement (P-CR)**

**Agenda Item: 4.1**

**Work Item / Release: EDGEAPP / Rel-17**

*Abstract of the contribution: proposed a “moderated email discussion”*

# 1 Discussion

there may be multiple answers about S2-2008358 = S6 LS on IP address to GPSI translation

1. Due to the closing of the study item SA2 agrees not to address this issue in the Rel-17 time frame
2. SA2 Completes NEF API specification to support UE addressing information as UE identifier as much as possible but a statement tells that: “In this release the case of UE addressing information corresponding to NATed Traffic is not supported”
3. SA2 Completes NEF API specification to support UE addressing information as UE identifier as much as possible including support of NAT
4. SA2 provides the exposure API to return a GPSI (if GPSI is available for the UE identified by IP address and port) when an IP address of the UE is provided.
5. We do not address this topic in SA2 142E

# 2 Proposal

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| --- | --- | --- | --- |
| **Company** | **supports** | **Objects to** | **Free text** |
| **Nokia** | 2,3 | 1, 4 | it does not look to be a good idea to not handle in R17Application requests targeting an UE identified by UE addressing information when 3GPP claims Edge Computing is a flagship of R17 . Conversely R17 is more than full.Having said that, solving the issue of UE addressing information corresponding to NATed IP address may be a second level of discussionAs explained in nokia’s paper, providing back a GPSI to the AF as in alternative 4 does NOT solve the NAT or IP address overlap issues as anyhow Alternative 4 starts with the AF providing UE IP addressing information |
| **Convida Wireless** | 3 | 1, 2 | We view the ability to translate an IP Address and Port Numebr to a GPSI as critical for Rel-17. The Nokia discussion paper (S2-2009003) and the LS from SA6 (S2-2008358/S6-202008) both give good explanations of why this feature is so important for Rel-17.Since we expect most Edge use cases to involve NAT, we can not justify not supporitng the NAT case.We have some problems with question 4. If the point of quesiton 4 is to ask if we only need to resolve IP Address to GPSI or do we need to resolve IP Address and Port to GPSI, then our answer is that we beleive that we need to resolve IP Address and Port to GPSI.If the point of Q4 is to ask if this needs to be done via the NEF, then our answer is that we believe that the NEF seems to make sense, but we are open to other options. NOTE: any soluton should also address the fact that a UE can have multiple GPSIs. For example, a UE can have multiple External IDs. |
| **Qualcomm** | 3 | 2, 4 | Given the interest shown by the different companies, we are fine to address the issue, with the following clarifications:* If we want to develop a solution, it should address all scenarios (including the NAT’ed one). An API to return a GPSI purely based on the UE’s IP address would not work for the NAT’ed scenario (the Port Number is also needed).
* If SA2 reaches an agreement on a solution it should be technically endorsed and sent to SA3 to get feeback on potential security issues (note that providing the UE’s GPSI to the AF does not solve the tracking issue that SA6 want to avoid).
* If no way forward is agreed, we are fine with postponing or not addressing the issue.
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| **China Mobile** | 2, and a new solution which I described in the text | 4 |  In our understanding for SA6 slides and LS, the requirement from their side is they thinking the IP address is not sufficient for a EAS to invoke the EES or NEF capability. This un-sufficient, part reason is from private or public IP address, other part reason is that they want to have a speific UE ID. For their new LS, SA6 do not intent to let us solve the IP address problem, So their requirement is for whether SA2 and SA3 can create a method to provide some UE ID to EAS. Our answer is, the UE ID can not be MSISDN, so using GPSI is not accuracy. **The new solution proposal:** While some external ID can be considered. I mean NEF can have a negotiation with the application and create a external ID for specific UE. SA3 may also need to be involved to protect the external ID e.g. changing this periodic. |
| **AT&T** | 4, 3 | 1, 2? | Having the translation API for IP address to GPSI (i.e. “EAS-specific UE External Id”) is essential to support EAS use cases. The GPSI in the form of “EAS-specific UE External Id” (not GPSI in the form of MSISDN) is needed so that:* the UE/user is anonymous to the EAS while EAS still can correctly identify this particular UE/user over API requests to EES/NEF.
* Add in addition to being an anonymous UE Identifier, the “EAS-specific UE External Id”, as the name implies, is an App-specific UE identifier so that UE’s behaviour across EASs cannot be tracked behind the scene by cooperating EAS players.

The function of mapping the static UE GPSI (i.e. External Identifier extracted from UDR/UDM by NEF) to an “EAS-specific UE External Id” can be provided by NEF if the EAS has been onboarded onto the NEF directly. Or this mapping function can be provided by the EES since EASs are onboarded onto EES and not NEF.Example use case: The App is fired up for the first time on the UE, user traffic reaches EAS which needs to uniquely but anonymously identify the UE/User. This cannot be done using UE’s IP address as UE IP address changes from one session to the next. So, EAS calls up IP\_Addr\_To\_GPSI\_Translation API onto EES/NEF and receives an “EAS-specific UE External Id” in response. EAS creates a record for this new user and also records the “EAS-specific UE External Id”. Time goes by and a week later the same UE/user starts up the App again, the EAS sees the source UE IP address and has no clue who it is and whether this is a returning user of a new one, so EAS calls up the IP\_Addr\_To\_GPSI\_Translation API onto EES/NEF (to identify the user) and receives an “EAS-specific UE External Id” in response. EAS looks up in its db for “EAS-specific UE External Id” and finds the user’s record/profile and customizes the App environment for the user accordingly. Next if EAS needs to know the UE’s location, it can make a Location API request onto EES/NEF using the “EAS-specific UE External Id” which uniquely identifies the user across sessions for as long as the user wants.As you see in the above example use case, EAS does not to keep track of UE IP Address to GPSI mapping. |
| **Samsung** | 4, 2?, 3? | 1, 2?, 3? | Supports 4 since 5GC can return the static UE identifier as requested by SA6.Can support 2 or 3 if 5GC returns a static UE identifier. Can not support 2 or 3 if 5GC does not return a static UE identifier.Once returning the static UE identifier is supported, the support of NAT’ed UE identifier  |
| **Intel** | 4 | 1,2,3 | Only option 4 addresses the SA6 request for returning a static identifier to the AF. We support Option 4 for both NATted and non-NATted addresses. It is also acceptable for Rel-17 to support only the case of non-NATted addresses. |
| **NTT DOCOMO** | 2, 4 |  | Agree with the analysis of AT&T. Additional considerations:- In order to consider privacy issues, the GPSI should be in the form of an external UE Id.- Based on Ericsson comments in the email thread, there can be multiple ways of implementing 4; the UE ID could be (SA3 feedback should be considered):a. GPSIb. GPSI with some additions to use a specific external ID for each applicationc. Other e.g. A NEF generated token/handleIn order to properly evaluate the detailed requirements and appropriate solutions, we propose to go for option 2 and address option 4 in Rel-18. |
| **HW** | 1 |  | 1. It’s clear SA6 is asking for option 4, not option 2 and 3 as their LS mentioned:

*Due to lack of reliable identification of the UE and the issues with using EAS provided IP address for CN capability exposure APIs, a better mechanism is desired.**SA6 therefore requests SA2 and SA3 for a reliable and secure core network capability which enables exposure of network services to AFs (e.g. EAS/EES) using a static identifier when only an IP address of the UE is known to them.* My reading is SA6 wants a IP->GPSI mapping firstly, then use the returned GPSI for further API invoking, not using IP directly in each API invoking as proposed in option 2 and 3.Not sure whether SA6 has compared the options or not, but these options do have different impacts to the AF and 5GC. For example, using IP address for invoking API will lead to further issue on how to update IP to the AF on time for SSC mode 2/3 or multihoming cases.I don’t think we can arbitrarily define a different solution other than what the LS requested, then tell SA6 we have resolved their problem in another different way.1. Technically, option 2,3,4 have same issue that how to ensure the UE IP address that AS can see is the one allocated within the network. Both NAT and proxy server on any place of the N6 path may change the source IP and we cannot simply assume all those functions are controlled/accessible by SMF to achieve the mapping information. A number of NAT/proxy/GW servers have already been deployed widely, and they don’t support expose the dynamic mapping information to SMF, or even they are not deployed by the MNO. Before we see the possibility for a feasible/acceptable solution to resolve the NAT/proxy issue, we don’t think we can decide to resolve the issue in this release.

Based on above reasons, we prefer to Qualcomm’s proposal that not discuss this issue in this release. |
| **Ericsson** | 4 |  | We think we should try honor the SA6 request and attempt to provide a solution in Rel-17, but we acknowledge that we are late in the releasse and we need to converge quickly towards a common view to make that happen.We think option 4 including support for NATed traffic (on the NEF-AF, NEF-BSF and NEF-UDM APIs) as described in S2-2008491 is a pragmatic way forward. We can also live with not including NATed traffic if that’s how SA2 wants to go.Regarding the UE ID to provide to the AF we think it could be a GPSI either as is or an application specific external ID. Potentially we could let SA3 and SA6 take the lead on specifying the details and align later.If we are to continue discussion based on the questions I would suggest a restrucuring: 1. Due to the closing of the study item SA2 agrees not to address this issue in the Rel-17 time frame
2. We do not address this topic in SA2 142E
3. SA2 Completes NEF API specification to support AFs using UE addressing information as UE identifier
	1. Without support for NATed Traffic
	2. Including support for NATed Traffic
4. SA2 provides the exposure API to return a UE ID to AFs for use in further transactions
	1. Without support for NATed Traffic
	2. Including support for NATed Traffic
5. The UE ID in 3 could be (SA3 feedback should be considered):
	1. GPSI
	2. GPSI with some additions to use a specific external ID for each application
	3. Other e.g. A NEF generated token/handle

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*End of changes*